

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2004/005441

International filing date (day/month/year)  
23.12.2004

Priority date (day/month/year)  
23.12.2003

International Patent Classification (IPC) or both national classification and IPC  
A61P31/04, A61K39/095

Applicant  
IMPERIAL COLLEGE INNOVATIONS LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☒ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☒ in written format  
☒ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☒ furnished subsequently to this Authority for the purposes of search.
3. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. II Priority**

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1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

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PCT/GB2004/005441

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

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The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 19, 31 (for reasons of industrial applicability), 24, 33

because:

- ☒ the said international application, or the said claims Nos. 19, 31 (for reasons of industrial applicability) relate to the following subject matter which does not require an international preliminary examination (*specify*):

**see separate sheet**

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the whole application or for said claims Nos. 12-23 (partially) 24, 33
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
  - the written form ☐ has not been furnished
  - ☐ does not comply with the standard
  - the computer readable form ☐ has not been furnished
  - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- ☐ See separate sheet for further details

**WRITTEN OPINION OF THE  
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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-15
	No: Claims	16-23, 25-32
Inventive step (IS)	Yes: Claims	1-15
	No: Claims	16-20, 22, 23, 25-32
Industrial applicability (IA)	Yes: Claims	1-18, 20-23, 25-30, 32
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

10/584367  
AP20 Rec'd PCT/PTO 23 JUN 2006  
International application No.

PCT/GB2004/005441

**Re Item III.**

1.1 Claims 19 and 31 relate to subject matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject matter of these claims (Article 34(4)(a)(i) PCT)

1.2 Claims 24 and 33 were not searched due to their not containing any technical features. They shall consequently not be examined.

**1.3 Article 6 PCT**

Claims 12-23 relate to methods, uses and entities employing or arrived at using the method disclosed in claim 1 of the application. As such, claims 12-23 are considered by the ISA to be reach-through claims which do not meet the requirements of Article 6 PCT for the following reasons:

1.4 Claims 12-23 lack clarity (Article 6 PCT) because they do not define any structural features of the polypeptides or genes claimed or employed in further methods. Such a feature is, however, essential for understanding the scope of the claims. The skilled person when reading claims 12-23 is therefore not able to comprehend the full scope of the claimed subject matter (Article 6 PCT).

1.5 Consequently, claims 12-23 were not susceptible to a meaningful search across their full scope and were searched only in so far as they related to the genes listed in claim 25.

**Re Item V.**

2 For the assessment of the present claims 19 and 31 on the question whether they are industrially applicable, no unified criteria exist within the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognise as industrially applicable the subject matter of claims to the use of a compound in medical treatment, but may allow, however, the use of such a compound for the manufacture of a medicament for a new medical treatment.

3 Reference is made to the following documents:

D1: WO 01/85772 A (MICROSCIENCE LIMITED; TANG, CHRISTOPH) 15 November

2001 (2001-11-15)

D2: TETTELIN H ET AL: "COMPLETE GENOME SEQUENCE OF NEISSERIA MENINGITIDIS SEROGROUP B STRAIN MC58" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 287, 2000, pages 1809-1815, XP000914963 ISSN: 0036-8075

#### **Article 33(2) PCT**

4.1 Document D1, discloses (page 2, lines 1-17, examples, claims) methods of determining *Neisseria meningitidis* genes associated with pathogenicity. Libraries of insertional mutants are generated and administered to rats, thus enabling the identification of attenuated mutants and thus genes associated with pathogenesis. These attenuated mutants may be useful as vaccine candidates as shown in the examples.

4.2 D1 is therefore prejudicial to the novelty of claims 16-23.

4.3 Document D2 discloses the complete genome sequence of *Neisseria meningitidis* and the genes contained in the genome (see table 1) and as such discloses the sequences listed in claim 25. D2 is consequently prejudicial to the novelty of claims 16, 22 and 25-32.

4.4 The subject matter of claims 1-15 are novel with regard to the prior art.

#### **Article 33(3) PCT**

5.1 For claim 1, the closest prior art is D1 which discloses (page 2, lines 1-17, examples, claims) methods of determining *Neisseria meningitidis* genes associated with pathogenicity. Libraries of insertional mutants are generated and administered to rats, thus enabling the identification of attenuated mutants and thus genes associated with pathogenesis. These attenuated mutants may be useful as vaccine candidates as shown in the examples.

5.2 The difference between the subject matter of claim 1 and D1 is that the selection of mutants in claim 1 is done by exposing the library to anti serum against *Neisseria*. Surviving mutants are assumed to have insertional mutations disrupting genes coding for antigenically important antigens.

5.3 The technical effect of the difference is that the selection in claim 1 identifies antigenically important antigens whilst that of D1 identifies genes which are important in the pathogenesis of the bacterium. The screening process of claim 1 is also carried out in vitro whilst that of D1 involves potentially large numbers of experimental animals.

5.4 The problem to be solved may therefore be considered to be to provide an in vitro screening method to identify antigenically important microbiological proteins.

5.5 Claim 1 of the application solves this problem and is inventive for the following reasons. D1 does not suggest that screening of mutants may be carried out in vitro and none of the prior art suggests that this is possible with anti serum generated against *Neisseria*.

5.6 The subject matter of claim 1 is therefore inventive (Article 33(3) PCT). The subject matter of claims 2-14 are also inventive (Article 33(3) PCT).